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MAGNETOTHERAPEUTIC DEVICE WITH BIO-CERAMIC FIBERS

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MAGNETOTHERAPEUTIC DEVICE WITH BIO-CERAMIC FIBERS

Copyright Authorization

Cross-References to Related Applications

This application is a continuation-in-part of United States Patent Application Serial Number 09/992,702 filed November 14, 2001, which is a continuation of U.S. Patent Application Serial No. 09/616,751 filed July 14, 2000 and which issued as U.S. Patent No. 6,383,129, which is related to issued to U.S. Provisional Patent Application Serial No. 60/143,809 filed on July 14, 1999. This application is also a continuation-in-part of United States Patent Application Serial Number 09/909,674 filed on July 19, 2001 entitled Deep Heating Magnetic Wrap for Joints and Tissue. The aforementioned applications are all hereby incorporated by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to magnetotherapeutic devices, and more particularly to a magnetotherapeutic device in the form of a disk or otherwise that is used in conjunction with bio-ceramic fibers to provide magnetotherapy and far infra-red treatment.

Description of the Related Art

Magnetotherapy is known in the art and used to provide relief for aches and pains by the application of magnetics, particularly strong magnets, to the affected area of the body. Due to the Hall effect and otherwise, the travel of fluids in the body past areas influenced by the magnetotherapeutic magnet or subject to magnetotherapy causes charges, such as those in electrolytes, to undergo forces and gently churn the fluids (such as blood, lymph, and plasma) in which they travel. Such innate activity of the bodily fluids may serve to stimulate a number of body processes.

Recent developments in the art have found that human tissue is advantageously susceptible to light in the far infra-red range. Infra-red light waves are generally known as heat waves and serve to warm objects thermally upon which such infra-red waves come into contact or shine upon. Light waves in the far infra-red may have a tendency to penetrate more deeply into the tissue and serve to stimulate such tissue accordingly.

The present invention provides means by which such effects may be combined into a conveniently applied unit, such that fluids coursing through the body may be stimulated by

magnetotherapy while the deeper tissues of the body may be subject to far infra-red stimulation in combination with such magnetotherapy.

SUMMARY OF THE INVENTION

The present invention provides a magnetotherapeutic device, such as one in the shape of a disk, that uses a strong neodymium (periodic element symbol Nd) to provide magnetotherapy to tissues adjacent the magnet. Additionally, such magnetotherapy is provided in conjunction with tissue treatment by far infra-red waves as bio-ceramic fibers are provided in conjunction with the supplied magnetotherapy.

Bio-ceramic fibers are able to radiate or provide far infra-red waves at room temperature and when heated to a body temperature of approximately 98.6°F. As magnetotherapy requires the application of the magnetism to tissue, by holding the present invention as a magnetotherapeutic device against the body, the accompanying bio-ceramic fibers allow the device to provide both magnetotherapy and far infra-red treatment to the adjacent tissue.

In order to provide a convenient and integral system, a plastic case circumscribes the entire manufacture. The bio-ceramic fibers are provided in the form of a mat covered with a perforated or foramenous MYLAR cover. Backing the bio-ceramic fiber mat may be the neodymium (Nd) or other strong magnet.

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perforated or foramenous MYLAR polyester or other plastic or resilient cover. Backing the bio-ceramic fiber mat may be the neodymium (Nd) or other strong magnet.

The neodymium magnet is such that it is very difficult to lift off a ferromagnetic surface such as a filing cabinet or otherwise. The strong magnet is backed with stainless steel or other similar material which reduces the magnetic effect of the strong magnet on the side opposite the bio-ceramic fiber mat and the perforated MYLAR cover. Indicia may be provided such as embossment of the stainless steel cover and the entirety of the manufacture may be encased in plastic. The stainless steel cover may augment the magnetic field on the opposite, or bio-ceramic, side of the magnet.

The perforations or openings present in the MYLAR cover of the bio-ceramic fiber mat serve to allow quicker warming by the body of the bio-ceramic fiber mat so that it may more quickly provide far infra-red treatment. It also provides unobstructed transmission of such far infra-red waves from the fibers adjacent the perforation holes.

OBJECTS OF THE INVENTION

It is an object of the present invention to provide magnetotherapy in conjunction with far infra-red treatment of body tissues.

It is another object of the present invention to provide such magnetotherapy by means of a strong magnet.

It is yet another object of the present invention to provide such far infra-red treatment by providing bio-ceramic fibers that radiate, transmit, emit, or provide far infra-red waves at least when brought to body temperature.

It is yet another object of the present invention to combine magnetotherapy and far infra-red wave treatment in an integral and consolidated device that is convenient to apply and use.

These and other objects of and advantages of the present invention will be apparent from a review of the following specification and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a side top perspective view of the bottom side of the magnetic disk embodiment of the present invention showing the bio-ceramic fibers covered by the perforated or foramenous MYLAR cover, all held in place by the circumscribing plastic rim of the disk.

Figure 2 is a top left side perspective view of the magnetic disk embodiment of Figure 1 showing the stainless steel top.

Figure 3 shows a top cutaway sectional view of the magnetotherapeutic and far infra-red wave disk of Figures 1 and 2.

Figure 4 shows a side cross sectional view of the disk of Figure 3.

Figures 5 and 6 show a checkerboard-type magnet configuration for use in the present invention.

Figures 7 and 8 show a triangular checkerboard magnet configuration for use in the present invention.

Figure 9 shows a circular and toroidal magnet configuration for use in the present invention.

Figure 10 shows a graph comparing the performance characteristics of neodymium, samarium, ferrite, and alnico magnets.

DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

The detailed description set forth below in connection with the appended drawings is intended as a description of presently-preferred embodiments of the invention and is not intended to represent the only forms in which the present invention may be constructed and/or utilized. The description sets forth the functions and the sequence of steps for constructing and operating the invention in connection with the illustrated embodiments. However, it is to be understood that the same or equivalent functions and sequences may be accomplished by different embodiments that are also intended to be encompassed within the spirit and scope of the invention.

Referring to the drawings where like numerals of reference designate like elements throughout it will be noted that the figures show different views of the magnetotherapeutic and bio-ceramic (far infra-red wave) device. The embodiments shown in the drawings are ones of a disk; however, other geometrical shapes may also advantageously implement the present invention. As shown in Figures 1 and 3, the magnetotherapeutic device of the present invention **50** has a plastic case **52** which covers the top **54**. The plastic case **52** may provide thermal, electrical and/or other insulation, operating as an insulator or otherwise. The plastic case **52** also forms a rim **56** circumscribing the device **50**. In the Figures, the device **50** is shown in the shape of a disk.

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case **52** which covers the top **54**. The plastic case **52** also forms a rim **56** circumscribing the device **50**. In the Figures, the device **50** is shown in the shape of a disk.

A stainless steel top cover **60** may be embossed with a figure or emblem **62**. The stainless steel top **60** also serves to limit or diminish the magnetic field generated by the strong magnet **70** past the top **54**, but may serve to augment the magnetic field below it.

The strong magnet **70** may also be in the shape of a disk and preferably so in the embodiments shown in the Figures. The strong magnet **70** provides the magnetotherapy present in the present invention. The magnet **70** may be made of neodymium (Nd) or the like or any other strong magnet that is currently available or developed in the future that is safe and non-toxic.

Below the magnet **70** is a woven mat or other structure of bio-ceramic fibers **80** such as those marketed by 3M™ under the Nextel™ trademark. As shown in the accompanying Exhibit, the Nextel™ 312 fabric provides good far infrared (FIR) emittance in the 8-14 micron wavelength range. From the Exhibit, the Nextel™ 312 fabric is made up of crystals less than 500 nanometers large of $9Al_2O_3{:}2B_2O_3$ + amorphous SiO_2. When the bio-ceramic fibers **80** are warmed by placement adjacent to the body, the far infra-red emittance may increase, providing greater far infra-red treatment in the 8-14 micron wavelength range.

In order to provide a permeable barrier by which the bio-ceramic fibers **80** may be warmed by placement adjacent to the body and through which far infra-red (FIR) emittance may be made, apertured or foramenous MYLAR polyester or other plastic or resilient cover **90** may form a circular cover for the bio-ceramic fibers **80**. The MYLAR may be sufficiently thick in order to properly retain the bio-ceramic fibers within the plastic case. The plastic case **52** may terminate on the bottom side adjacent to the apertured MYLAR **90** in a rim into which

the circumference of the apertured MYLAR **90** fits. The apertures **92** may be evenly spaced across the surface of the apertured MYLAR **90**.

Neodymium (Nd) is currently preferred as the magnetic material used to constitute the strong magnet as its performance characteristics exceed those of samarium, ferrite, and alnico as can be seen in Figure 10. In the graph shown in Figure 10, the neodymium material provides the most powerful magnetic material. The load line on the graph in Figure 10 indicates the maximum operational field and induction output of each material where the load line crosses the curve. Clearly, the neodymium magnet possesses the highest magnetic field output.

The present invention can provide a maximum field extension normal to its planar surface of approximately 3 inches with a field strength of 1.5 gauss at that distance. This is 6 times the field extension of a regular magnet known in the art. The maximum field strength at the surface of the present invention is in excess of 2000 gauss.

In order to enhance such magneto therapeutic properties, especially for iron or electrolytic fluids passing in proximity to such strong magnetic fields, Figures 5 through 9 show a variety of magnetic figurations to provide for alternating magnetic polarity as travel is made along the magnets of the present invention. By arranging for alternate polarity, changing magnetic fields are encountered by charged molecules or atoms passing sufficiently proximate to the magnetic joint wrap so as to be subject to its magnetic fields. It is known that such changing magnetic fields induce currents and will also serve to exert both repelling and attractive forces upon such charged molecules or atoms.

The stainless steel cap **60** provides electromagnetic strength to the side applied to the body (the apertured MYLAR **90** side). The stainless steel cap **60** also provides an aesthetically

pleasing and highly polished mirror-like finish upon which a company logo or the like may be embossed.

In order to use the magnetotherapeutic device and the bio-ceramic fibers of the present invention, a pouch or band is used to place the device adjacent the skin. The heat from the body raises the temperature of the adjacent bio-ceramic fibers **80** through the apertured MYLAR **90** or otherwise. The bio-ceramic fibers **80** emit light in the far infra-red spectrum, preferably along the 8-14 micron wavelength range. The strong neodymium or other magnet **70** permeates the adjacent tissue with the available magnetic field, subjecting such tissue to magnetotherapy.

By providing a double-barreled approach whereby both magnetotherapy and far infra-red therapy are simultaneously provided, the present invention provides means by which better tissue therapy may be provided by both methods or treatment regimes. There may be some synergistic functions provided in the simultaneous application of both magnetotherapy, even strong magnetotherapy, and the far infra-red wave treatment.

While the present invention has been described with regards to particular embodiments, it is recognized that additional variations of the present invention may be devised without departing from the inventive concept.